In the Matter of	)	
	)	
Establishment of a Model for Predicting	)	ET Docket No. 10-152
Digital Broadcast Television Field Strength at	)	
Individual Locations	)	

REPLY COMMENTS OF THE
NATIONAL ASSOCIATION OF BROADCASTERS AND
THE ASSOCIATION FOR MAXIMUM SERVICE TELEVISION

Jane E. Mago
Benjamin F.P. Ivins
Kelly Williams
NATIONAL ASSOCIATION OF BROADCASTERS
1771 N Street, N.W.
Washington, D.C. 20036
(202) 429-5430

David L. Donovan
ASSOCIATION FOR MAXIMUM
 SERVICE TELEVISION
4100 Wisconsin Avenue, N.W.
Washington, D.C. 20016
(202) 966-1956

Wade H. Hargrove
David Kushner
BROOKS, PIERCE, MCLENDON,
 HUMPHREY & LEONARD, L.L.P.
150 Fayetteville Street, Suite 1600
Raleigh, North Carolina 27601
(919) 839-0300

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Summary

The Satellite Television Extension and Localism Act of 2010 ("STELA") calls upon the Commission to "establish procedures for the continued refinement in the application of the [Individual Location Longley-Rice ("ILLR")] model by the use of additional data as it becomes available."[1] The statutory mandate for adding such data and refining the ILLR model is that it produces a model that is more "reliable" and "accurate."[2] Accuracy and reliability are defined in terms of whether the model will more accurately and reliably predict whether a household is eligible to receive distant network signals.[3]

In compliance with this mandate, the Commission, in this proceeding, seeks to determine whether a proposal by Sidney Shumate would enhance the accuracy and reliability of the ILLR model. The opening Comments of NAB and MSTV demonstrated that the Shumate proposal failed to meet the high standards require to refine the ILLR model. Specifically, the Shumate proposal is faulty because (1) necessary details and the source code required to evaluate the proposal have not been made available; (2) the source code is proprietary and copyrighted; (3) the proposal has not been peer reviewed; (4) the proposal suggests a fundamentally new calculation methodology; and, most importantly, (5) no evidence shows that the Shumate proposed model would actually increase the accuracy of the ILLR model.

Although Mr. Shumate provided more than 950 pages of additional material in the comment phase, serious and substantial omissions preclude any meaningful analysis or an ability

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[1] 47 U.S.C. § 339(c)(3).

[2] 17 U.S.C. § 119(a)(2)(B)(ii).

[3] *See* H.R. CONF. REP. NO. 106-464 at 104 (1999).

to replicate Mr. Shumate's results. Again, most significantly, Mr. Shumate's comments provide no evidence that his proposed modifications would make the go/no-go determinations required by STELA any more accurate. Accordingly, these modifications should not be adopted.

While virtually ignoring the Shumate proposal, DIRECTV and DISH each submitted new proposals to modify the ILLR model. Both proposals are also seriously flawed; indeed, they would each make the ILLR model significantly less accurate and should be rejected.

At the outset, it is immediately evident that both the DIRECTV and DISH proposals are "reverse engineered" in the sense that the science and engineering employed are designed to support a pre-ordained result: create new "unserved households" from which the carriers can profit or use to skew retransmission consent negotiations.

DIRECTV's proposal to substitute the retailer/consumer-oriented AntennaWeb model for the ILLR model would drastically under-predict actual television service. The AntennaWeb model was never intended to predict eligibility to receive distant network signals within the narrow statutory constraints of the Communications and Copyright Acts. Rather, that model's purpose was to facilitate the purchase of consumer antennas. The AntennaWeb model (1) has not been peer reviewed for purposes of STELA; (2) is not compliant with STELA's eligibility standards or the DTV planning factors; and (3) does not reflect actual television service coverage. Accordingly, the AntennaWeb model is, for scientific, legal, and policy reasons, an unsuitable substitute for the existing ILLR model.

DISH also suggests modifying the ILLR model in two respects. First, DISH distorts Mr. Shumate's unverified results to claim that *51% of households* predicted by the ILLR model to be served are not. This claim is clearly false. DISH takes a worst-case scenario and then blatantly conflates area with households. It assumes a bias in the ILLR model that does not exist

and for which DISH has presented no evidence. DISH then seeks to arbitrarily adjust the calculations in a way that would upset the balance of over-predictions and under-predictions, thereby making the model <u>less</u> accurate.

Second, DISH, yet again, proposes what the Commission has correctly and repeatedly rejected—incorporating additional adjustments for land use and land cover ("LULC") for the VHF bands. After extensive analysis, the Commission correctly determined that any such adjustments would make the ILLR model <u>less</u> accurate, a determination that has been upheld by the courts. The Commission should, once again, reject DISH's request to revisit LULC adjustments for VHF stations.

The Commission has stated that rulemakings to improve upon the accuracy of the ILLR model will be considered "upon the filing of a petition for such a rule making that is supported by high quality engineering studies containing conclusions based on reliable and publicly available measurement data."[4] None of the proposals submitted in this proceeding even begin to approach compliance with these criteria. Accordingly, this rulemaking should be terminated.

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[4] *Establishment of an Improved Model for Predicting the Broadcast Television Field Strength Received at Individual Locations,* ET Docket No. 00-11, 15 FCC Rcd 12118 (2000), at ¶ 21.

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REPLY COMMENTS OF THE
NATIONAL ASSOCIATION OF BROADCASTERS AND
THE ASSOCIATION FOR MAXIMUM SERVICE TELEVISION

The National Association of Broadcasters ("NAB")[1] and the Association for Maximum Service Television ("MSTV")[2] hereby reply to the comments submitted in response to the Further Notice of Proposed Rulemaking ("*Notice*") released on November 23, 2010, in the above-captioned proceeding. In the *Notice* the Commission seeks comment on a proposal by Sidney Shumate to modify the digital Individual Location Longley-Rice ("ILLR") model set forth in newly-adopted OET Bulletin No. 73, The ILLR Computer Program for Predicting Digital Television Signal Strengths at Individual Locations.

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[1] The National Association of Broadcasters is a nonprofit trade association that advocates on behalf of free, local radio and television stations and also broadcast networks before Congress, the Federal Communications Commission and other federal agencies, and the Courts.

[2] The Association for Maximum Service Television, Inc. is a nonprofit trade association focusing on the technical aspects of over the air television broadcasting.

I.   It Remains Premature to Consider, Let Alone Adopt, Mr. Shumate's Proposed Revisions to the ILLR Model

In response to the Commission's *Notice*, Mr. Shumate submitted more than 950 pages of materials in connection with his Irregular Terrain with Obstructions Model ("ITWOM"),[3] including what he claims to be printed source code, documentation, and test results. All of this material was submitted on the date initial comments on Mr. Shumate's proposal were due; none of it was available in advance for the parties' review or peer review.

Mr. Shumate's submissions raise even more questions about the propriety of his proposal. Significantly, Mr. Shumate has not provided support for his proposed modifications by independent experts nor has he provided sufficient analyses comparing the ILLR model with his ITWOM model. The code is very complex, and it would take significant efforts by experts to determine whether the proposed modifications do what Mr. Shumate claims. A large number of analyses need to be undertaken to compare the ILLR model and the ITWOM model, and then to compare those results with actual measured data. These studies would need to cover a wide range of conditions to determine how each model responds, and they must contain enough data points to be statistically valid.

After Mr. Shumate submitted his new materials, NAB and MSTV's consulting engineers, Meintel, Sgrignoli, & Wallace ("MSW"), obtained from Mr. Shumate the revised code in digital format. MSW was able to get the code running but has been unable to replicate Mr. Shumate's

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[3] Mr. Shumate argues for adoption of his ITWOM model which would replace the current line of site loss calculation and, instead, calculate losses close to obstructions using a system which he claims is scientifically based. *See Establishment of a Model for Predicting Digital Broadcast Television Field Strength Received at Individual Locations*, Report and Order, ET Docket No. 10-152, FCC 10-194 (Nov. 23, 2010), at ¶ 16.

results.[4] For example, Mr. Shumate provided a spreadsheet (whose columns are insufficiently identified) that purports to show the results comparing the ILLR model and the ITWOM model against 1069 measurements. Mr. Shumate asserted that the source of the measurement data was 34 separate files published on February 10, 1996, in Docket No. 87-268.[5] However, as explained in the attached Reply Engineering Statement, MSW determined that little or none of the data shown in Mr. Shumate's spreadsheet actually comes from the stated source.[6] Thus, neither the source of the measurement data nor its validity can be confirmed.

In addition, Mr. Shumate's submissions do not clearly state how he performed his own analyses. Were the studies based on 50% time variability or 90% time variability? He derived at least some of his results from analog station data and therefore should use 50% time variability. The studies should also include elevation and azimuth patterns which can make significant differences at locations near the transmitter. It is not clear whether the studies include these patterns. The ITWOM model also has additional parameters that are not included in the ILLR model, but it is unclear how these parameters were set when Mr. Shumate performed his studies.[7]

Mr. Shumate states that his ITWOM model utilized average clutter height and density for the results reported in the spreadsheet.[8] The Commission in its November 2010 *Report and*

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[4] *See* Reply Engineering Statement of Meintel, Sgrignoli, & Wallace, LLC ("MSW Reply Engineering Statement") (attached hereto as an Appendix), at ¶ 14.

[5] *See* Petition for Rulemaking and Comment filed by Mr. Sidney E. Shumate, ET Docket Nos. 00-11 & 10-152 (filed Aug. 24, 2010), at 7.

[6] *See* MSW Reply Engineering Statement at ¶¶ 7-8.

[7] *See* MSW Reply Engineering Statement at ¶¶ 11-12. MSW outline other deficiencies in Mr. Shumate's submissions in their Reply Engineering Statement.

[8] *See* Comment of Givens & Bell, Inc. (Sidney E. Shumate, President), ET Docket

Order in this docket, however, expressly rejected Mr. Shumate's recommendation to use clutter height and density factors instead of LULC adjustments:

> We also find that it would not be practical to introduce clutter height and density factors into the clutter calculations of the ILLR software at this time as suggested by Mr. Shumate. Also, there is no height and density information available for the current LULC data. Accordingly, we will apply the land use and land cover categories and USGS clutter loss values for describing land use and land cover features in the digital TV ILLR model in the same manner as these elements are currently incorporated into the SHVIA ILLR model.[9]

Consequently, none of Mr. Shumate's purported results for the ITWOM model are directly relevant to the two proposed changes for which the Commission is seeking comment in this proceeding, namely the results of calculating diffraction loss close to an obstacle or leading up to and following a pair of obstacles and the use (or non-use) of additional losses in the line of sight range above and beyond the free space loss and two-ray loss.[10] Moreover, it is unclear whether Mr. Shumate ran his model only with average clutter height and density factors or also included the OET 72/73 protocol for LULC adjustments. If the latter, then the effects of land use and land cover would incorrectly have been double-counted.

(continued . . .)
No. 10-152 (filed Jan. 21, 2011), at 2 ("The worksheet presents the consolidated results of the FCC ILLR tests best results, obtained with the ITM-based ILLR model, as compared to the results obtained with the ITWOM 3.0 basic international model, which utilizes an average clutter height and density.").

[9] *Establishment of a Model for Predicting Digital Broadcast Television Field Strength Received at Individual Locations*, Report and Order, ET Docket No. 10-152, FCC 10-194 (Nov. 23, 2010), at ¶ 46.

[10] *See Establishment of a Model for Predicting Digital Broadcast Television Field Strength Received at Individual Locations*, Report and Order, ET Docket No. 10-152, FCC 10-194 (Nov. 23, 2010), at ¶ 58.

In sum, Mr. Shumate's submissions continue to fail to provide any evidence that his proposed modifications would actually make prediction of service/no service to determine eligibility for distant network service more accurate than the ILLR model.

Moreover, as noted in NAB/MSTV's Comments, Mr. Shumate's proposed model needs to be peer reviewed by the scientific and engineering communities.[11] If peer review confirms the underlying science and its proper implementation in the model, then, and as DISH states, the Commission needs to undertake "extensive and rigorous field studies" to confirm the test results cited by Mr. Shumate.[12]   At this time, however, it is plain that any consideration of implementation of Mr. Shumate's proposals is premature.

II.   The Satellite Carriers' Proposals Are Motivated Not by Science But by Financial Advantage

As explained below, DIRECTV's and DISH's proposed modifications to the ILLR model should be rejected because they would plainly make the model less accurate. DIRECTV's proposal to substitute the AntennaWeb model for the Commission's new OET 73 digital ILLR model is a radical alteration that would grossly under-predict service to tens of millions of Americans. DISH's proposal is based on a fundamental misunderstanding of Mr. Shumate's own data and seeks to add, yet again, another arbitrary adjustment to the predictive model for LULC. The Commission has repeatedly rejected both types of attempts to skew the purpose and results of the ILLR model, and the Commission should do so again.

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[11] Comments of NAB and MSTV, ET Docket No. 10-152 (filed Jan. 21, 2011) ("NAB and MSTV Comments"), at 13.

[12] Comments of DISH Network L.L.C., ET Docket No. 10-152 (filed Jan. 21, 2011) ("DISH Comments"), at 2.

Congress did not intend the refinement provision in Section 339(c)(3) to undermine the localism objective of the statute by creating many new "unserved" households. The satellite carriers' modifications do not demonstrate or reflect scientific or engineering merits. Rather, they appear designed principally to exploit and expand the distant compulsory license far beyond what Congress intended. Indeed, it is difficult to understand their reasons for modifying a remarkably successful predictive tool when DISH today offers local-into-local satellite service in all 210 DMAs and DIRECTV "deliver[s] local programming to nearly 98 percent of Americans."[13]

The satellite carriers have admitted that they sometimes have a financial incentive to circumvent carriage of local stations by carrying distant network signals instead.[14] The carriers do not need to obtain retransmission consent[15] or pay retransmission consent fees for distant network signals but instead pay a below market rate compulsory royalty.[16] However, as the Broadcaster Associations noted in their September 2010 comments filed in this docket, the satellite carriers charge their customers nearly *ten times* their cost in distant signal royalty fees.[17] Thus, it is not surprising that the satellite carriers proposed modifications here seem more

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[13] Comments of DIRECTV, Inc., MB Docket No. 10-238 (filed Jan. 24, 2011), at 8.

[14] *See, e.g.*, DISH Network *Ex Parte* Presentations, ET Docket No. 10-152; ET Docket No. 06-94 (filed Aug. 30, 2010), at 2.

[15] *See* 47 U.S.C. § 325(b)(2)(C).

[16] *See* 17 U.S.C. § 119(b).

[17] *See* Comments of the Broadcaster Associations, ET Docket No. 10-152 (filed Sept. 3, 2010), at 18-19.

designed to achieve these strategic benefits than to enhance the predictive accuracy of the existing ILLR model.

Certainly nothing in STELA or its predecessors evinces any congressional intent to reduce the program exclusivity of local stations or to reduce carriage of local signals or to adversely affect retransmission consent negotiations in the way apparently desired by the satellite carriers here. Rather, it has been Congress's intent, since the inception of the distant network signal statutory license, to preserve broadcast localism and protect the copyright exclusivity held by local stations for the exhibition of their network programming in their local markets.[18]

III. DIRECTV's Proposal to Replace the OET 73 Digital ILLR Model with the AntennaWeb Model Is Inconsistent with Congressional Intent, Will Grossly Under-Predict Actual Local Television Service, and Should Be Rejected

DIRECTV's proposal to substitute the retailer/consumer-oriented AntennaWeb model for the Commission's new OET 73 digital ILLR model, which is based upon the long-established and scientifically-accepted Longley-Rice model, would violate the fundamental "linchpin" of congressionally-sanctioned refinements to the ILLR model[19]: Far from "provid[ing] more

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[18] *See* SHVIA Conference Report, 145 CONG. REC. H11792 (Nov. 9, 1999) ("[T]he Conference Committee reasserts the importance of protecting and fostering the system of television networks as they relate to the concept of localism. . . . To that end the Committee has structured the copyright licensing regime for satellite to encourage and promote retransmissions by satellite of local television broadcast stations to subscribers who reside in local markets of those stations."); H.R. REP. No. 100-887, pt. 2, at 19-20 (1988); H.R. REP. No. 100-887, pt. 1, at 14 (1988).

[19] *See* H.R. CONF. REP. No. 106-464, at 104 (1999) ("The linchpin of whether particular proposed refinements to the ILLR model result in greater accuracy is whether the revised model's predictions are closer to the results of actual field testing in terms of predicting whether households are served by a local affiliate of the relevant network.").

accurate results," as DIRECTV claims,[20] the proposal would result in tens of millions of truly "served" households suddenly becoming presumptively "unserved."[21]

The Commission has long-recognized that the ILLR model "should not increase or decrease the number of truly unserved households."[22] The ILLR model already strikes the appropriate balance. As the Commission has observed, the value of the ILLR model "is borne out by the data on the record of its performance, which shows that using the values adopted by the Commission the ILLR model produces approximately an equal number of over predictions as under predictions."[23] Data, in fact, have shown the ILLR model's accuracy rate to be almost 95%.[24]

A. The AntennaWeb Model Was Never Intended to Predict Television Service

The AntennaWeb model was not designed or intended to predict eligibility for distant network signals under 17 U.S.C. § 119. Instead, its purpose was to facilitate the purchase of

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[20] DIRECTV Comments at 3.

[21] *See* Section III.C *infra*.

[22] *Satellite Delivery of Network Signals to Unserved Households for Purposes of the Satellite Home Viewer Act*, CS Docket No. 98-201, 14 FCC Rcd 2654 (1999), at ¶ 71.

[23] *Satellite Home Viewer Extension and Reauthorization Act of 2004, Study of Digital Television Field Strength Standards and Testing Procedures*, Report to Congress, ET Docket No. 05-182, FCC 05-199 (Dec. 9, 2005), at ¶ 148. *See also Establishment of a Model for Predicting Digital Broadcast Television Field Strength Received at Individual Locations*, Report and Order, ET Docket No. 10-152, FCC 10-194 (Nov. 23, 2010), at ¶ 46 ("Analysis of the data on the model's performance shows that using the values used in the SHVIA ILLR model produce approximately an equal number of over-predictions as under-predictions.").

[24] *See Satellite Home Viewer Extension and Reauthorization Act of 2004, Study of Digital Television Field Strength Standards and Testing Procedures*, Report to Congress, ET Docket No. 05-182, FCC 05-199 (Dec. 9, 2005), at ¶ 143.

antennas as the television industry was transitioning to DTV.[25] In order to achieve its goal, the

AntennaWeb model is designed to be *extremely conservative*: It runs the ILLR model in a

non-standard, non-peer-reviewed way to intentionally *under-predict* service. Accordingly, it is

not compliant with the satellite law's eligibility standard or the Commission's DTV planning

factors or the various inputs in the ILLR model's path-loss calculation and does not reflect actual

television service coverage. The AntennaWeb model is purposely biased to favor antenna

manufacturers and antenna retailers' desire to avoid antenna returns.[26]   Thus, because not all

antennas have the same specifications, the AntennaWeb model is designed to reflect the poorest

performing antenna in a particular class.[27]

The AntennaWeb model was designed to be extremely conservative because its

development was *prior* to the completion of the DTV transition. The AntennaWeb designers did

not want to over-promise and under-deliver with respect to the antennas that would be

recommended for reception of stations post-DTV transition at a time when DTV performance

was still uncertain.[28] What is now known is that the vast majority of DTV stations' coverage

areas were accurately predicted by the OET 69 Longley-Rice model, which has done more than a

serviceable job. The AntennaWeb model has not been updated since March 2007.[29]

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[25] *See* Declaration of Kenneth A. Franken ("Franken Declaration") (attached hereto as Exhibit 1), at ¶ 5. *See also id.* at ¶ 4 ("The AntennaWeb model was not designed to predict the actual service area of a television station.").

[26] *See* Franken Declaration at ¶ 5.

[27] *See* Franken Declaration at ¶ 5.

[28] *See* Franken Declaration at ¶ 6.

[29] *See* Ken Franken, Decisionmark Corp., *Antenna Recommendation Algorithm for ATSC Transmitters* (attached as Exhibit A to DIRECTV Comments), at 1; *see also* Franken Declaration

The AntennaWeb model designers are well aware that the model under-predicts actual television service.[30] The results page of the website plainly tells consumers: "The above listing is a *conservative* prediction of stations received. Depending on the specifics of your installation, you may be able to receive stations that do not appear in this list."[31] Indeed, Mr. Ken Franken, the listed author of the AntennaWeb algorithm attached to DIRECTV's comments, has provided anecdotal evidence that the AntennaWeb model under-predicts service 10 times more often than it over-predicts service.[32]

B. Section 119 Has Always Balanced the Benefits and Harms to Both Consumers and Copyright Owners

Contrary to the private commercial reasons why AntennaWeb was constructed the way it was, Congress has always been concerned with striking the proper balance for the public interest in enacting and amending the distant network signal license in Section 119 of the Copyright Act. Each of the satellite laws has had a dual purpose: (1) to enable households located beyond the reach of a local affiliate, primarily in rural areas,[33] to obtain access to a life-line broadcast

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(continued . . .)
at ¶ 6.

[30] *See* Franken Declaration at ¶ 5.

[31] AntennaWeb.org Results Page, *available at* <http://antennaweb.org/aw/Stations.aspx> (desired location must be input into the form in order to access this page) (emphasis added).

[32] *See* Franken Declaration at ¶ 7 ("[I]n my estimation, I receive 10 emails saying that the consumer receives more stations than predicted for every one email saying the consumer cannot receive a station that was predicted to be received.").

[33] *See, e.g.*, H.R. Rep. No. 100-887, pt. 1, at 15 (1988) ("[The bill] will benefit *rural America* . . . ." (emphasis added)); H.R. REP. NO. 108-660, at 10 (2004) ("Its [the Section 119 license] primary purpose is to ensure that those residing in *rural* areas or in areas where terrain makes it impossible to receive an acceptable over-the-air signal from their television stations can

network programming by satellite and (2) to protect the integrity of the copyrights that make possible the existing free, over-the-air national network/local affiliate broadcast distribution system.[34]

Section 119, therefore, has always represented a careful balance between the interest, on the one hand, in allowing households located beyond the reach of a local network station to secure access to broadcast network programming and, on the other hand, in preserving "localism" by protecting the copyrights each local network station has for the broadcast of its network programming in its local market.[35] Each of these laws was designed to protect the exclusivity of the copyright held by each affiliate for exhibition in its market of its network programming.[36] At the heart of these laws is an acknowledgment by Congress of the national interest in promoting consumer access to "local" broadcast service including the longstanding, free, universally-available, over-the-air national network/local affiliate television distribution

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(continued . . .)
receive a '*life-line*' network television service from a satellite provider." (emphases added)); SHVIA Conference Report, 145 CONG. REC. H11792-H11793 ("[T]he specific goal of the Section 119 license is to allow for a *life-line network television service* to those homes which cannot receive the local network television stations. Hence, the unserved household limitation that has been in the license since its inception." (emphasis added)).

[34] *See* H.R. REP. NO. 100-887, pt. 1, at 8 (1988); H.R. REP. NO. 108-660, at 11 (2004).

[35] *See* SHVIA Conference Report, 145 CONG. REC. H11792 ("[T]he Conference Committee reasserts the importance of protecting and fostering the system of television networks as they relate to the concept of localism. It is well recognized that television broadcast stations provide valuable programming tailored to local needs, such as news, weather, special announcements and information related to local activities. To that end the Committee has structured the copyright licensing regime for satellite to encourage and promote retransmissions by satellite of local television broadcast stations to subscribers who reside in local markets of those stations.").

[36] *See* H.R. REP. NO. 100-887, pt. 2, at 19-20 (1988); H.R. REP. NO. 100-887, pt. 1, at 14 (1988).

system—a system Congress acknowledged "has served the country well."[37]

The SHVIA Conference Report observes that "allowing the importation of distant or out-of-market network stations in derogation of the local station's exclusive right—bought and paid for in market negotiated arrangements—to show the works in question, undermines those arrangements."[38] Congress, therefore, intended that the scope of this extraordinary privilege be extremely narrow. As the SHVIA Conference Report further recognized:

> [P]erhaps most importantly, the Conference Committee is aware that in creating compulsory licenses, it is acting in derogation of the exclusive property rights granted by the Copyright Act to copyright holders, and that it therefore *needs to act as narrowly as possible* to minimize the effects of the government's intrusion on the broader market in which the affected property rights and industries operate.[39]

Similarly, Congress in SHVERA continued to express its recognition of the need to minimize the abrogation of the rights of local broadcast stations:

> The abrogation of copyright owners' exclusive rights and the elimination of transaction costs for satellite carriers are valuable accommodations that benefit the DBS industry. The terms and conditions of § 119, therefore, are crafted to represent a careful balance between the interests of satellite carriers who seek to deliver distant broadcast programming to subscribers in a manner that is similar to that offered by cable operators, and the need to provide copyright owners of the retransmitted broadcast programming fair compensation for the use of their works.
> [. . .]
> Where a satellite provider can retransmit a local station's exclusive network programming but chooses to substitute identical programming from a distant network affiliate of the same network

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[37] H.R. REP. NO. 100-887, pt. 2, at 20 (1988); H.R. REP. NO. 108-660, at 11 (2004).

[38] SHVIA Conference Report, 145 CONG. REC. H11792.

[39] SHVIA Conference Report, 145 CONG. REC. H11792 (emphasis added).

instead, the satellite carrier undermines the value of the license negotiated by the local broadcast station as well as the continued viability of the network-local affiliate relationship. . . .

The Committee has consistently considered market-negotiated exclusive arrangements that govern the public performance of broadcast programming in a given geographic area to be preferable to statutory mandates. Accordingly, a second purpose of the unserved household limitation is to confine the abrogation of interests borne by copyright holders and local network broadcasters to only those circumstances that are absolutely necessary to provide the "life-line" service.[40]

It is for these reasons, in part, that the Commission has always sought to construe its implementation of the satellite laws, including the ILLR model, to be consistent with the overarching public interest balance struck by Congress. This policy balance has meant that the predictive model must be balanced as well: "Importantly, our model should not increase or decrease the number of truly unserved households."[41] Later, in its *2005 Report to Congress*, the Commission further stated:

Any predictive model that is prescribed should provide output that is as accurate as possible; anything less would diminish its value as a tool for determining whether a household is able to receive off-the-air digital television signals. . . . This has been borne out by the data on the record of its performance, which shows that using the values adopted by the Commission the ILLR model produces approximately an equal number of over predictions as under predictions.[42]

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[40] H.R. REP. NO. 108-660, at 9-11 (2004).

[41] *Satellite Delivery of Network Signals to Unserved Households for Purposes of the Satellite Home Viewer Act*, CS Docket No. 98-201, 14 FCC Rcd 2654 (1999), at ¶ 71.

[42] *Satellite Home Viewer Extension and Reauthorization Act of 2004, Study of Digital Television Field Strength Standards and Testing Procedures*, Report to Congress, ET Docket No. 05-182, FCC 05-199 (Dec. 9, 2005), at ¶ 148. *See also Establishment of a Model for Predicting Digital Broadcast Television Field Strength Received at Individual Locations*, Report and Order, ET Docket No. 10-152, FCC 10-194 (Nov. 23, 2010), at ¶ 46 ("Analysis of the data on the model's performance shows that using the values used in the SHVIA ILLR model

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The simple fact is that the AntennaWeb model has a wholly different purpose than the OET 73 ILLR model the Commission has just adopted in this proceeding. The purpose of the AntennaWeb model is, in fact, not consistent with congressional policy for the distant network signal license. Its use in the context of Section 119 would result in gross under-predictions of actual television service and would undermine both the balance Congress has consistently sought to achieve in crafting the Section 119 license and the balance the Commission has actually achieved with an ILLR model with 95% accuracy in determining distant network signal eligibility.

C. The AntennaWeb Model Under-Predicts Actual Local Television Service

The AntennaWeb model makes vastly different predictions of television service than the ILLR model. For different antennas, the AntennaWeb model may, depending on the circumstances, add as much as 26 dB to the Commission's planning factors for the noise-limited signal intensity standard for UHF stations, increasing the 41 dBu threshold to 67 dBu. The AntennaWeb model:

* Adds 3 dB to the UHF receiver noise figure.

* Adds 2.5 dB to the minimum carrier/noise ratio.

* Adds 12 dB as a multipath margin for non-directional antennas.

* Adds 6.5 dB as an assumed splitter loss.

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(continued . . .)
produce approximately an equal number of over-predictions as under-predictions.").

        *   Assumes all but the largest antennas have no gain (0 dB) or even losses up to 25 dB, and even in the case of the largest UHF antenna assumes a gain 2 dB less than the OET 69 conservative planning factor.[43]

In addition, the AntennaWeb model further increases the degradation of signal reception prediction by increasing the confidence (situational) variability statistical parameter from 50% to 90%, rather than maintaining the standard OET 69, OET 72, and OET 73 50% confidence parameter for median situations. This results in an additional loss to the standard signal intensity prediction of another 10 db to 15 dB for UHF stations. Thus, if one were to apply AntennaWeb's algorithm to coverage prediction, it could require, in some circumstances, a signal intensity threshold of as much as 82 dBu for UHF stations, rather than 41 dBu. For example, a UHF digital television station that currently broadcasts with an Effective Radiated Power ("ERP") of 1,000 kW might need to increase its radiated power more than 12,589 times— in excess of 10 billion watts of power—to satisfy the AntennaWeb model's addition of 41 dB of signal strength.[44]

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[43] *See* Ken Franken, Decisionmark Corp., *Antenna Recommendation Algorithm for ATSC Transmitters* (attached as Exhibit A to DIRECTV Comments), at 4.

[44] With respect to the need for an additional 30 dB of power, the Commission stated in its 2005 *Report to Congress*: "A 30 dB power increase would mean that a station operating at 1 MW DTV power would need to operate with 1000 MW, an enormously high power level that is not achievable by currently available TV transmitters," and "[s]uch power levels are not practical as they would greatly increase the potential for interference between stations and pose power costs for stations that would likely be so high as to threaten the economic viability of many stations." *Satellite Home Viewer Extension and Reauthorization Act of 2004, Study of Digital Television Field Strength Standards and Testing Procedures*, Report to Congress, ET Docket No. 05-182, FCC 05-199 (Dec. 9, 2005), at ¶ 43 n.112 (first quotation), ¶ 43 (second quotation).

Each of these non-standard changes to the ILLR model "simply puts a thumb on the scale in favor of one side,"[45] contrary to the statutory directive and congressional intent. Moreover, each of the various planning factors for which DIRECTV would add a margin has already been exhaustively examined and confirmed in the context of the ILLR model in the Commission's 2005 *Report to Congress*.[46]

In addition to these various extra, conservative margins added to the Commission's planning factors, the AntennaWeb model also uses, as noted above, time and confidence (situational) variability factors of 90%/90%,[47] rather than the OET 69, OET 72, and OET 73 specifications of 90% time/50% confidence.[48] This has the effect of adding additional losses to the minimum field strength threshold in a typical situation as follows[49]:

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[45] 145 CONG. REC. S15022-23 (Nov. 19, 1999) (statement of Sen. Leahy).

[46] *See Satellite Home Viewer Extension and Reauthorization Act of 2004, Study of Digital Television Field Strength Standards and Testing Procedures*, Report to Congress, ET Docket No. 05-182, FCC 05-199 (Dec. 9, 2005).

[47] *See* Ken Franken, Decisionmark Corp., *Antenna Recommendation Algorithm for ATSC Transmitters* (attached as Exhibit A to DIRECTV Comments), at 2.

[48] DIRECTV incorrectly asserts that the AntennaWeb model changes the location variability factor to 90%. *See* DIRECTV Further Comments at 10. As the Commission explains in newly-adopted OET 73, "[w]hen point-to-point mode is used, as in ILLR, there are well-defined paths with fixed terminals, so there is no location variability. There is still a "confidence" or "situational" variability factor, which is taken here to be 50%." OET Bulletin No. 73, The ILLR Computer Program for Predicting Digital Television Signal Strengths at Individual Locations (Nov. 23, 2010), at 5 n.7. It is the confidence/situational variability factor that the AntennaWeb model changes to 90%. See also the MSW Reply Engineering Statement at ¶¶ 20-23 for further discussion.

[49] The calculation of loss or "fading" as a function of time and confidence percentages is fairly complex, and it is dependent on the transmitter/receiver path as well as the channel. The results in the text were calculated by TitanTV for a typical, but hypothetical, station operating on the stated channels. MSW estimates more generally that increasing the confidence factor from 50% to 90% would result in a reduction in the predicted field strength in a range of from 10 dB

(continued . . .)

* For Channel 4, a range from 12.5 dB to 14 dB, with an average around 13.25 dB.

* For Channel 9, a range from 14.2 dB to 14.9 dB, with an average around 14.6 dB.

* For Channel 33, a range from 15.25 dB to 15.4 dB, with an average around 15.3 dB.

These losses reflect the goal of the AntennaWeb designers to maximize retailer interests so that virtually no recommended antenna could fail to receive a station predicted to be receivable and thereby disappoint a consumer. But they are contrary both to the Commission's original propagation curves as derived from empirical data and to the Commission's implementation of Longley-Rice in all of its manifestations. The Commission has repeatedly recognized that it is interested in *median* situations, not extremes, when it comes to predicting television service.[50] It should be obvious that by moving away from median situations, a predictive model would necessarily be putting a thumb on one side of the scale, which is precisely the opposite of the task that Congress has assigned the Commission with respect to the ILLR model.

The cumulative effect of the AntennaWeb model's very conservative predictive methodology is dramatic. DIRECTV provides a plot of the predicted service coverage of

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(continued . . .)
to 13 dB. *See* MSW Reply Engineering Statement at ¶ 22.

[50] *See, e.g.*, OET Bulletin No. 69, Longley-Rice Methodology for Evaluating TV Coverage and Interference (Feb. 6, 2004), at 6 ("The percent confidence is set at 50% indicating that we are interested in median situations.); OET Bulletin No. 72, The ILLR Computer Program (July 2, 2002), at 3 ("the confidence variability factor to be used is 50%, indicating median situations"); OET Bulletin No. 73, The ILLR Computer Program for Predicting Digital Television Signal Strengths at Individual Locations (Nov. 23, 2010), at 5 ("the confidence variability factor to be used is 50%, indicating median situations").

KCRG, the ABC affiliate in Cedar Rapids, Iowa, under both the ILLR model and the AntennaWeb model.[51] While DIRECTV provides no statistical details, it appears from visual inspection that at least 50% of the area that is predicted to be served by the ILLR model is predicted to be "unserved" under the AntennaWeb model. It is, of course, highly improbable that half or more of the area that the Commission's planning factors and implementation of Longley-Rice predict to receive a noise-limited digital television signal cannot actually receive the signal.

What is particularly telling is DIRECTV's interpretation of this plot: "When subscribers in these areas contact DIRECTV seeking distant signals, it must tell them they are ineligible because they are predicted to receive over-the-air local signals through use of 'an antenna.'"[52] That response, however, is misleading and inconsistent with the law. The reason these subscribers are ineligible to receive a distant network signal is because DIRECTV offers local-into-local service in the Cedar Rapids television market and has done so since October 2004.[53] These subscribers are thus ineligible because of the "if local, no distant" principle, not because they may be predicted on the AntennaWeb.org website not to be able to receive KCRG with an antenna.[54] The "if local no distant" principle, in turn, is part of STELA's objective "to protect the role of local broadcasters in providing over-the-air television by limiting satellite delivery of

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[51] *See* DIRECTV Further Comments at 7.

[52] DIRECTV Further Comments at 7.

[53] *See* DIRECTV, Inc., Satellite Television Extension and Localism Act of 2010 (STELA) Section 305 Report (filed Nov. 23, 2010), Exhibit A, at 3.

[54] Of course, even the AntennaWeb website does not tell these consumers that they cannot receive KCRG with any antenna, as DIRECTV claims. The website expressly notes that additional stations may be receivable with an antenna.

network broadcasting programming to subscribers who were 'unserved' by over-the-air signals."[55]

D. There Is No Evidence That the AntennaWeb Model's Use of One Arc-Second Terrain Data Improves the ILLR Model's Eligibility Determination

DIRECTV asserts that AntennaWeb utilizes more accurate geographical/terrain databases and that these should be incorporated into the predictive model because they will result in a more accurate prediction of television service.[56] While it is true that the AntennaWeb model relies on the 1 arc-second USGS DEM database and combines this with 1 arc-second elevation data from the shuttle radar terrain mapping project, DIRECTV presents no evidence that this "nine times" more dense data will actually improve the ILLR model eligibility determination.

In fact, Mr. Shumate in his original comments in this docket argued that more detailed terrain data could not make the ITM model more accurate because of the way the calculation methodology is implemented. Mr. Shumate states that the ITM model was designed to work only with a 30 arc-second database and that finer terrain data causes the delta-h calculation in the *dlthx* subroutine to miscalculate with finer data. Mr. Shumate concludes:

> [A]s the terrain database used becomes more detailed, the ITM attenuation results become less accurate overall. . . .
> In addition, the averaging system prevents the higher detail from significantly improving the determination of the actual height and nature of the individual points the [model] is attempting to calculate for. So improving the detail of the terrain database alone

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[55] *Implementation of Section 203 of the Satellite Television Extension and Localism Act of 2010*, Notice of Proposed Rulemaking, MB Docket No. 10-148 (released July 23, 2010) at ¶ 5.

[56] *See* DIRECTV Further Comments at 8-9.

cannot significantly improve the accuracy of the individual
location calculation![57]

DIRECTV has made no attempt to explain how the AntennaWeb model's reliance on

1 arc-second terrain data actually improves the model's predictive capability; it simply assumes

that finer resolution data must be better. And DIRECTV has made no attempt to rebut

Mr. Shumate's argument that finer resolution data cannot significantly improve the model's

predictive capability, even though Mr. Shumate's criticism is contained in the very Petition for

Rulemaking that prompted the Commission's issuance of the *Notice*. Furthermore, Meintel,

Sgrignoli, & Wallace, NAB and MSTV's consulting engineers, do not believe that either higher

resolution terrain data or additional SRTM clutter data will have any significant impact on the

statistics of the accuracy of the ILLR model.[58]

DIRECTV also claims that the AntennaWeb model's "snap-to" feature, by which the

profile point is not averaged from the surrounding grid points but rather is "snapped" to the

nearest grid point, "means that, in areas of variable elevation, ILLR will systematically tend to

ignore interference while AntennaWeb will more accurately account for that interference."[59]

Interference, however, is irrelevant to determining whether the minimum field strength to

provide television service is available. In its November 2010 *Report and Order* in this docket,

the Commission stated:

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[57] Petition for Rulemaking and Comment filed by Mr. Sidney E. Shumate, ET Docket Nos. 00-11 & 10-152 (filed Aug. 24, 2010), at 5.

[58] *See* MSW Reply Engineering Statement at ¶¶ 18-19.

[59] DIRECTV Further Comments at 9.

> We are not including adjustments to account for interference and multipath in the digital ILLR model. As the Commission observed in its *2005 Report to Congress*, a receiver's ability to provide service in the presence of interfering signals is not relevant to the field strength needed to provide service. While the presence of other signals on the same or adjacent channels does have the potential for disrupting service, the effects of other signals are a separate matter from the basic functioning of a receiver in an interference-free environment that forms the basis for the Commission's field strength standards. . . . Further, we see no indication in the STELA that Congress intended that we add interference or multipath consideration to the signal strength standard. We also observe that at locations where interference or multipath are present, consumers can often take steps such as repositioning or re-orienting their antenna to resolve the impact and achieve reception. Accordingly, we find no basis or need for including adjustments to the digital ILLR model for interference or multipath.[60]

In short, DIRECTV provides no evidence that the ILLR model's use of terrain data as specified in newly-adopted OET 73 should be modified.

IV. DISH's Proposals to Modify the ILLR Model Are Based on Fundamental Errors or Misunderstandings and Should Be Rejected

DISH proposes that an arbitrary adjustment based on Mr. Shumate's tentative results be subtracted from the ILLR model's prediction at an individual location and also that the Commission revisit its conclusion that the ILLR model not incorporate additional adjustments for land use and land cover ("LULC") for the VHF bands.[61] Each of these proposals is based on

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[60] *Establishment of a Model for Predicting Digital Broadcast Television Field Strength Received at Individual Locations*, Report and Order, ET Docket No. 10-152, FCC 10-194 (Nov. 23, 2010), at ¶ 19 (footnotes omitted). *See also Satellite Home Viewer Extension and Reauthorization Act of 2004, Study of Digital Television Field Strength Standards and Testing Procedures*, Report to Congress, ET Docket No. 05-182, FCC 05-199 (Dec. 9, 2005), at ¶¶ 101-104.

[61] *See* DISH Comments.

fundamental errors or a misunderstanding of the underlying data, and there is, accordingly, no warrant for modifying the ILLR model as DISH proposes.

DISH cites Mr. Shumate's claims that the ILLR model over-predicts service by 6.61 dB on average whereas Mr. Shumate's ITWOM model over-predicts service by just 1.93 dB on average. As a result, DISH claims that 51% of households predicted to be served are actually unserved. Consequently, DISH proposes that 1.93 dB be subtracted from the ILLR model's predicted value until a more precise predictive model is available.[62]

DISH's claims are simply wrong. Even if Mr. Shumate's claim that the ILLR model over-predicts service by 6.61 dB on average were true—and there is no evidence that Mr. Shumate's non-peer-reviewed and to-date unverified and unverifiable results are accurate—this does not mean that 51% of households predicted to be served are actually unserved.

First, Mr. Kurby, DISH's consulting engineer, calculated a ratio of *areas* affected by the ILLR model's alleged 6.61 dB over-prediction of signal strength. No calculation of the number of *households* affected was made or attempted. Households are not evenly dispersed throughout television station service areas. As a general matter, stations' towers are placed where they are most likely to provide coverage to the most densely populated areas. The in-market fringe areas of a television station's service coverage area tend to be sparsely populated in comparison with the core city or cities being served.[63]

Second, Mr. Kurby calculated the area ratio at 50 km (30 miles) for an assumed antenna height of 600 meters (approximately 2000 feet) using the Commission's F(50,50) curves for the

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[62] *See* DISH Comments at 4.

[63] *See* MSW Reply Engineering Statement at ¶¶ 29-30.

low VHF band. These curves assume a modest ERP of 1 kW. Meintel, Sgrignoli, & Wallace, NAB and MSTV's consulting engineers, believe that Mr. Kurby appears to have improperly selected the worst-case scenario for a broadcast station.[64] Even so, at 50 km these curves show a field strength of 57.5 dBu, well above the 47 dBu field strength threshold required for an analog low VHF band station.[65] Were the ILLR model to have predicted 64.1 dBu (57.5 + 6.6) for a household located at this distance from the transmitter, *it would have accurately predicted the household to be served*.[66]

Third, and most importantly, DISH and Mr. Kurby seem to miss the point that the ILLR model's only task is to predict service or lack of service for purposes of the "unserved household" definition. As the underlying details of Mr. Kurby's own example shows, if the ILLR model predicts a household to be able to receive a low VHF signal of 64.1 dBu and a field test measurement shows the actual field strength to be 57.5 dBu, the ILLR model may not have precisely predicted the field strength, but it did *accurately* predict the household's lack of eligibility for distant network service. In fact, the accumulated evidence before the Commission

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[64] *See* MSW Reply Engineering Statement at ¶ 31.

[65] Because Mr. Kurby used the F(50,50) curves for his calculations, rather than F(50,90) curves, reference to analog signals is appropriate, and, as a theoretical matter, makes no difference to the points being addressed here.

[66] Mr. Kurby's area ratio should have been calculated at a distance of 90 km (which approximately yields a field strength of 40.4 dBu, all else held equal). The alleged over-prediction of 6.61 dB would amount to a predicted field strength of 47 dBu at a distance of 75 km. In these circumstances if the ILLR model predicted the household to be served, it would likely not be. In this case, the outermost 30% of the area—not 51% of the households—would be the zone where the ILLR model could result in an over-prediction, if it were uniformly biased to over-predict by 6.61 dB—<u>which it is not</u>. Of course, far fewer than 30% of the households located in a station's DMA live in the fringe area 75 km to 90 km distant from a typical station's tower. *See* MSW Reply Engineering Statement at ¶¶ 32-35.

shows that the ILLR model makes *accurate* predictions of service/lack of service 95% of the time.[67] This is an incredibly successful result.

In addition, as NAB and MSTV pointed out in their initial comments, while Mr. Shumate's ITWOM model appears to be biased to uniformly over-predict field strength,[68] the ILLR model has been demonstrated to be evenly balanced in the number of over-predictions and under-predictions.[69] This, rightly, avoids placing "a thumb on the scale in favor of one side or the other."[70]

In sum, DISH has fundamentally misconstrued what Mr. Shumate's unverified results may tentatively show. DISH's proposal to arbitrarily and automatically subtract 2 dB from the ILLR model's predictions assumes a bias in the ILLR model that has not been demonstrated in the now-long record of ILLR implementation and for which DISH has presented no evidence. DISH's proposal should be rejected because it fails to satisfy the Commission's standard that a

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[67] *See Satellite Home Viewer Extension and Reauthorization Act of 2004, Study of Digital Television Field Strength Standards and Testing Procedures*, Report to Congress, ET Docket No. 05-182, FCC 05-199 (Dec. 9, 2005), at ¶ 143.

[68] *See* NAB and MSTV Comments at 15.

[69] *See Satellite Home Viewer Extension and Reauthorization Act of 2004, Study of Digital Television Field Strength Standards and Testing Procedures*, Report to Congress, ET Docket No. 05-182, FCC 05-199 (Dec. 9, 2005), at ¶ 148 ("[U]sing the values adopted by the Commission the ILLR model produces approximately an equal number of over predictions as under predictions."). *See also Establishment of a Model for Predicting Digital Broadcast Television Field Strength Received at Individual Locations*, Report and Order, ET Docket No. 10-152, FCC 10-194 (Nov. 23, 2010), at ¶ 46 ("Analysis of the data on the model's performance shows that using the values used in the SHVIA ILLR model produce approximately an equal number of over-predictions as under-predictions.").

[70] 145 CONG. REC. S15022-23 (Nov. 19, 1999) (statement of Sen. Leahy) ("The FCC has properly recognized that reducing one type of errors, underprediction, while increasing another type of errors, overprediction, does not increase accuracy, but simply puts a thumb on the scale in favor of one side or the other.").

proposal to "improve the accuracy of the ILLR model" must be "supported by high quality engineering studies containing conclusions based on reliable and publicly available measurement data."[71]

DISH's other proposal, to revisit LULC adjustments for VHF stations, is similarly infirm. DISH asserts that the alleged upward bias of the ILLR model in predicting field strength as shown by the unverified claims of Mr. Shumate requires the Commission to reassess "artificially" setting LULC adjustments for the VHF bands at 0 dB.[72] The underlying premises of DISH's assertions are false, however. Moreover, as the Commission is aware, DISH has already litigated this issue in the Court of Appeals and lost. *See EchoStar Satellite L.L.C. v. FCC*, 457 F.3d 31 (D.C. Cir. 2006).

Predictive models such as Longley-Rice already account for clutter factors such as buildings and vegetation inasmuch as they are empirically-based. As the Longley-Rice Manual explains, the model combines certain theoretical treatments

> using empirical relations derived as fits to measured data. This combination of elementary theory with experimental data makes it a *semi-empirical* model . . . .
> *The data used in developing the empirical relations have clearly influenced the model itself.* It should then be noted that these data were obtained from measurements made with fairly clear foregrounds at both terminals. In general, ground cover was sparse, but some of the measurements were made in areas with moderate forestation. *The model, therefore, includes effects of*

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[71] *Establishment of an Improved Model for Predicting the Broadcast Television Field Strength Received at Individual Locations*, ET Docket No. 00-11, 15 FCC Rcd 12118 (2000), at ¶ 21.

[72] DISH Comments at 2-3.

*foliage, but only to the fixed degree that they were present in the
data used.*[73]

The fact that Longley-Rice is semi-empirical and incorporates the then-existing clutter in the

model is well-recognized in the scientific and technical community.[74] And the Commission

itself has acknowledged this fact.[75]

In creating the ILLR model, the Commission was careful to include additional clutter,

above and beyond that already accounted for in the semi-empirical model itself, *only* where it

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[73] G.A. Hufford *et al.*, *A Guide to the Use of the ITS Irregular Terrain Model in the Area Prediction Mode*, NTIA Report 82-100 (U.S. Dep't of Commerce Apr. 1982) ("Longley-Rice Manual"), at 12 (emphases added); *see also id.* at 22.

[74] *See, e.g.*, R. Grosskopf, *Comparison of Different Methods for the Prediction of the Field Strength in the VHF Range*, 35 IEEE TRANS. ON ANTENNAS & PROPAGATION 852 (July 1987), 852 (stating that in the Longley-Rice model "empirically gained quantities influence the field strength prediction"); M.L. Meeks, *VHF Propagation over Hilly, Forested Terrain*, 31 IEEE TRANS. ON ANTENNAS & PROPAGATION 483 (May 1983), 488 (recognizing the semi-empirical nature of the Longley-Rice model and the fact that if affects the model's prediction of propagation loss); M.M. Weiner, *Use of the Longley-Rice and Johnson-Gierhart Tropospheric Radio Propagation Programs: 0.02-20 GHz*, 4 IEEE J. ON SELECTED AREAS IN COMMUNICATIONS 297 (Mar. 1986), 297 (stating that Longley-Rice is a "statistical/semi-empirical model[] of tropospheric radio propagation"); *id*. at 299 (stating that it is necessary to take account of vegetation only in the immediate vicinity of the receiving antenna because "knife-edge diffraction by vegetation distant from the antennas is usually included in the semi-empirical methods used for estimating the excess propagation loss").

[75] *See Establishment of a Model for Predicting Digital Broadcast Television Field Strength Received at Individual Locations*, Report and Order, ET Docket No. 10-152, FCC 10-194 (Nov. 23, 2010), at ¶ 43 ("The method for considering these land cover factors is to assign certain signal loss values, *in addition to those already factored in the model for terrain variation*, as a function of the LULC category at the reception point." (emphasis added)); *Satellite Home Viewer Extension and Reauthorization Act of 2004, Study of Digital Television Field Strength Standards and Testing Procedures*, Report to Congress, ET Docket No. 05-182, FCC 05-199 (Dec. 9, 2005), at ¶ 141 (quoting NAB comments); *see also EchoStar Satellite L.L.C. v. FCC*, 457 F.3d 31, 36 (D.C. Cir. 2006) (stating that the Commission argued before the court that "the ILLR model already takes into account land cover variation because the model 'was itself derived from empirical observations of signal intensity, and those observations would themselves have reflected some degree of clutter loss'" (quoting the Commission's brief)).

made the model more accurate. Thus, the Commission determined that any clutter loss values greater than 0 dB would make the model *less accurate* in the low VHF and high VHF bands for signal predictions.[76] Whether the ILLR model suffers from any of the infirmities that Mr. Shumate ascribes to it, double counting clutter losses will upset the fine balance of over-predictions and under-predictions that the current model so successfully achieves and it will not make the ILLR model more accurate. The Commission should dismiss DISH's request to re-investigate LULC adjustments for VHF stations.

Conclusion

For the foregoing reasons, as well as those set forth in NAB and MSTV's initial comments, the Commission should reject Mr. Shumate's proposal to modify the digital ILLR model as discussed in the *Notice*. The Commission should also reject the separate proposals of DIRECTV to substitute the AntennaWeb model for the ILLR model and of DISH to modify the ILLR model based upon a misapplication of the Shumate proposal and arbitrary LULC adjustments.

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[76] *See Satellite Home Viewer Extension and Reauthorization Act of 2004, Study of Digital Television Field Strength Standards and Testing Procedures*, Report to Congress, ET Docket No. 05-182, FCC 05-199 (Dec. 9, 2005), at ¶ 148.

Respectfully submitted,

Jane E. Mago
Benjamin F.P. Ivins
Kelly Williams
NATIONAL ASSOCIATION OF BROADCASTERS
1771 N Street, N.W.
Washington, D.C. 20036
(202) 429-5430

          /s/
David L. Donovan
ASSOCIATION FOR MAXIMUM
  SERVICE TELEVISION
4100 Wisconsin Avenue, N.W.
Washington, D.C. 20016
(202) 966-1956

          /s/
Wade H. Hargrove
David Kushner
BROOKS, PIERCE, MCLENDON,
  HUMPHREY & LEONARD, L.L.P.
150 Fayetteville Street, Suite 1600
Raleigh, North Carolina 27601
(919) 839-0300

February 7, 2011

Exhibit 1

In the Matter of	)	
	)	
Establishment of a Model for Predicting	)	ET Docket No. 10-152
Digital Broadcast Television Field Strength at	)	
Individual Locations	)	

DECLARATION OF KENNETH A. FRANKEN

1.   I, Kenneth A. Franken, am more than 18 years of age and am competent to make this Declaration.

2.   I am the Director, Content Exchange Platform, for Broadcast Interactive Media, which owns TitanTV, formerly known as Decisionmark. I have worked at Decisionmark/ TitanTV/Broadcast Interactive Media for 14 years.

3.   In my position I have implemented the predictive computer model used on the AntennaWeb.org website. In my position I have also implemented the predictive computer model, the Individual Location Longley-Rice (ILLR) model as established by the Federal Communications Commission, that is used to assess the eligibility of a satellite subscriber to receive a distant network signal under the "unserved household" definition in the Copyright Act.

4.   Although I am listed as the author of the document titled "Antenna Recommendation Algorithm for ATSC Transmitters" whose algorithm is implemented on the AntennaWeb.org website, the AntennaWeb computer model was designed by a committee, upon which I serve as a member. The principal purpose of the AntennaWeb model is to recommend a certain class of receiving antenna optimized for a specific location with a specific set of installation parameters. The AntennaWeb model was not designed to predict the actual service

area of a television station.

5.　　　The AntennaWeb model was intentionally designed to be very conservative in its estimation of field strength at an individual location. This was done for two primary reasons. First, the model was biased to favor antenna manufacturers and antenna retailers. The designers wanted to ensure, with near certainty, that if a consumer purchased a particular antenna recommended for its location, the antenna would receive the television stations predicted by the AntennaWeb website to receive those stations and the consumer would not return the antenna to the retailer. The designers know that the AntennaWeb model under-predicts actual television service. The results page on the AntennaWeb website tells consumers the following: "The above listing is a conservative prediction of stations received. Depending on the specifics of your installation, you may be able to receive stations that do not appear in this list." The intention of the AntennaWeb website is not to predict television service but to ensure that a particular class of antenna will work at a specific location virtually without fail. Because not all antennas in a particular class are manufactured with the same specifications, the AntennaWeb model must also be conservative to account for the poorest performing antenna in a particular class.

6.　　　The second reason the AntennaWeb model is conservative is because it was designed prior to the completion of the national transition to digital television service. The designers of the AntennaWeb model believed that they needed to err on the side of caution to satisfy the principal purpose of the website, which, again, was to recommend a certain class of receiving antenna that was virtually guaranteed to work at a particular site. The AntennaWeb model has not been updated since the digital television transition.

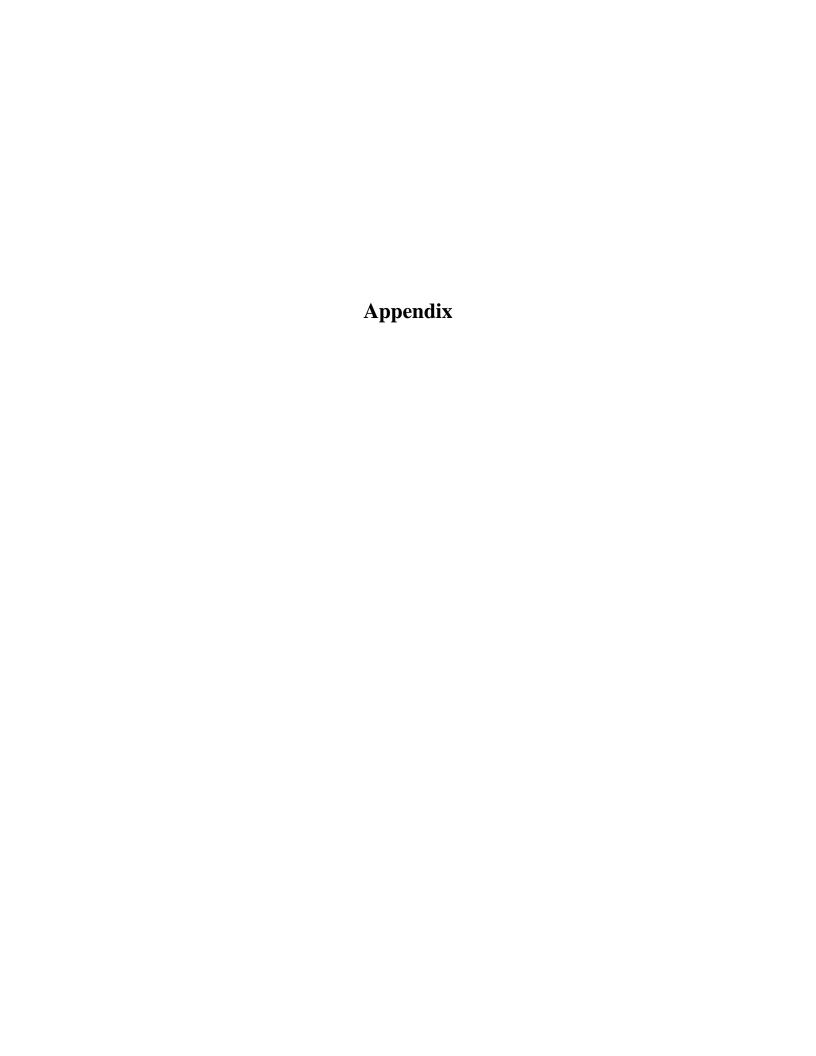7.　　　As the individual responsible for implementing the AntennaWeb model, I receive

email correspondences from consumers who use the AntennaWeb website. By far, the most common comment I receive is that a consumer can receive many more television stations than the AntennaWeb model predicts. A typical email comment might state that the AntennaWeb predicts the consumer can receive three television stations but they can actually receive eight. I do sometimes receive emails where an individual states that he or she cannot receive a television station that the AntennaWeb website predicts the individual should receive. However, in my estimation, I receive 10 emails saying that the consumer receives more stations than predicted for every one email saying the consumer cannot receive a station that was predicted to be received.

8.   I declare, under penalty of perjury, that the foregoing is true and accurate to the best of my knowledge, information, and belief.

2/3/11
Date

Kenneth A. Franken

Appendix

In the Matter of	)	
	)	
Establishment of a Model for Predicting	)	ET Docket No. 10-152
Broadcast Television Field Strength	)	
Received at Individual Locations	)	
	)	

REPLY ENGINEERING STATEMENT OF
MEINTEL, SGRIGNOLI, & WALLACE, LLC

1. At the request of the National Association of Broadcasters ("NAB")[1] and the

Association of Maximum Service Television ("MSTV"),[2] the undersigned have prepared this

Reply Engineering Statement in connection with the Commission's Further Notice of Proposed

Rulemaking relating to the model for predicting broadcast digital television reception.[3] The

credentials and experience of the undersigned are on file with the Commission and part of the

record of this proceeding. We have conducted thousands of digital signal intensity tests in a

variety of locations throughout the United States, helped to design and test state-of-the-art digital

television receivers, and developed industry-standard computer-based analysis applications and

specialized software concerning RF propagation. This Reply Engineering Statement provides

the Commission with the benefit of this experience.

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[1]   The National Association of Broadcasters is a nonprofit trade association that advocates
on behalf of free, local radio and television stations and also broadcast networks before
Congress, the Federal Communications Commission and other federal agencies, and the Courts.

[2]   The Association of Maximum Service Television is a nonprofit trade association that
advocates, on behalf of local radio and television stations and broadcast networks, before
Congress, the Commission and other federal agencies, and the courts.

[3]   Federal Communications Commission, ET Docket No. 10-152, Report and Order and
Further Notice of Proposed Rulemaking (released November 23, 2010).

2.   In this proceeding, the Commission requests additional information and comment

regarding possible modifications to the existing ILLR model utilized for the purpose of

determining eligibility to receive distant television signals in the context of satellite viewers.

The Commission received several comments in the proceeding regarding possible changes to the

propagation prediction model that is used for determining eligibility for distant network signals.

I.   The Shumate Source Code

3.   Givens & Bell, Inc., by its president Sidney E. Shumate (Shumate), submitted to

the Commission the source code and documentation of the ITWOM model that Shumate

proposes as a replacement for the current ILLR software. In addition, Shumate also submitted a

spreadsheet that purports to show a comparison of the current ILLR model and his proposed

ITWOM model.

4.   The C++ source code submitted by Shumate is actually two separate sets of code,

one of which he indicates is a "drop in" module to the publicly available SPLAT program. The

other set of code is indicated to be a dual model that would replace the core ITM (Irregular

Terrain Model a/k/a Longley-Rice) propagation model in the current ILLR program. He states

that the purpose of the dual model allows for doing comparison studies between the current

ILLR methodology and his proposed new methodology. In other words, the provided code

purports to contain both the current ITM (ILLR) model and the new ITWOM model. He states

that the separate studies are performed by either the function point_to_point (ITM version) or

point_to_point_two (ITWOM version). He indicates that these were the modules used to

develop the comparison results presented in the submitted spreadsheet.

II.   The Shumate Proposal Cannot Be Properly Analyzed

5.   Before the Commission can even begin to consider Shumate's proposal, it must

be complete, transparent, and comprehensible. The following shortcomings make any

meaningful analysis of the proposal impossible at this time:

- The provided code contains two additional point_to_point modules:
point_to_pointMDH and point_to_pointDH. Although Shumate indicates that the
appropriate modules to use are point_to_point and point_to_point_two, the
inclusion of these additional modules creates confusion as to exactly what is being
proposed.

- Neither of the sets of provided code is a complete working model in that they
require "wrap around" software to provide the core software with the analysis
parameters. The wrap around code is required to obtain all the analysis
parameters, including the transmit frequency, power, antenna height (both
transmit and receive), and terrain profile points.

- In addition, the wrap around must also convert the output from the Shumate
point_to_point functions to field strength, adjusting for the fact that the result
from his software has an embedded value for free space loss that is not compatible
with the FCC's method of computing field strength. All of this makes it
extremely difficult to compare the ILLR results to the ITWOM.

6.   Adding to the difficulty of evaluating the proposal is a very confusing spreadsheet

that purports to show the results of the ILLR model and the proposed ITWOM model compared

to 1069 measurements. The spreadsheet has numerous columns, many of which are either not

labeled or lack sufficient labels to explain their meaning.

III.   The Shumate Comparisons of ILLR and ITWOM Are Uncorroborated and the Shumate Results Cannot Be Duplicated

7.   The source of the measured data listed in the spreadsheet and its validity have not

been confirmed. Shumate states the source of the data is that published on February 10, 1996, in

proceeding 87-268 and identified in the FCC's ECFS as "ADVANCED TELEVISION TEST" in

34 separate .pdf files.

8. However, a review of that data reveals that it does not contain the 1,069 measurements listed in the provided spreadsheet. In fact, that report only contains data for 115 NTSC measurements (Shumate's Charlotte data all appears to be NTSC) from a project conducted by the ATTC and others in Charlotte, NC in 1995 and does not appear to be the data reported by Shumate. Shumate's spreadsheet, in contrast, contains 400 Charlotte data points, and there is no explanation as to the source of any of these 400 Charlotte data points or of the other 669 measurements contained in the spreadsheet.

9. Yet another shortcoming of the Shumate comparison data is that the spreadsheet does not seem to contain the actual predicted field strength from the ITWOM model. Instead, it just seems to report the "error" with respect to the measured field strength. Is it to be assumed that the predicted value is the error added to the measured value? It is not clear what these numbers actually represent.

10. While the Shumate comparison spreadsheet does report the field strength value predicted by the ILLR model, it is unclear whether the reported value takes into consideration the required adjustment for the LULC. Without this information verification and duplication of the results are impossible.

11. In addition, there is also no indication as to whether antenna elevation patterns were considered for the transmitted signal or, for that matter, whether an azimuth pattern was considered if the station employs a directional antenna. The exclusion of either of these can cause a significant difference in the computed field strength. This would be especially true for sites near the transmitter where the elevation pattern can significantly reduce the power towards the receive point.

12. A significant number of the data points in the Shumate spreadsheet are for

measurements of analog stations. In those cases both the ILLR as well as the ITWOM

evaluation should have been performed on the basis of 50% time variability instead of the 90%

time variability used for digital. However, there is no indication which time variability factor

was employed, which makes the verification of the results impossible.

13.   Yet another problem is that the Shumate comparison studies using the ITWOM

model appear to have been performed using clutter height and density factors that the

Commission has previously rejected. That being the case, it is not possible to evaluate the results

with respect to just the modifications of the calculation of diffraction loss close to an obstacle or

leading up to and following a pair of obstacles and the additional losses in the line of sight range

above and beyond the free space loss and two-ray-loss as specifically requested by the

Commission in its FNPRM. Hence, the Shumate proposal does not meet the objectives with

respect to the potential modifications as outlined in the FNPRM for consideration by the

Commission.

14.   Although we were eventually able to implement the ITWOM model provided by

Shumate, we were not able to verify the comparison data provided in the spreadsheet. The

deficiencies noted above and the lack of parameters for some of the transmitting facilities for the

stations that were studied by Shumate have made any meaningful analysis of Shumate's proposal

impossible at this time.

IV.   The Over-Prediction of the ILLR Model As Suggested by Shumate Has Not Been Independently Verified or Analyzed

15.   The results claimed by Mr. Shumate of an *average* +6.61dB over-prediction for

the ILLR model and his claim of +1.93dB over-prediction for the ITWOM model have not been

peer reviewed or otherwise independently verified or studied by knowledgeable peers.

16.   Critical examination of the proposed model and its input parameters, and verification of its results, along with extensive comparisons to measured signal levels in a variety of environments, are critical steps that must be undertaken prior to any adoption of any new model by the Commission. To date, Mr. Shumate has not sought this extensive and necessary peer-review process.

V.   Post-Analysis Study and Review Are Required Before Adoption of the Proposal Could Be Considered

17.   The existing ILLR model, Shumate's code, and the underlying propagation theory are extremely complex. Therefore, even if all of the above referenced flaws were remedied, a significant amount of time will be required to study the proposed modifications to the ITM (ILLR) methodology and to make any determination as to their validity. Even if the theory and the code implementation are proven to be valid, a very large number of field studies will be required to compare the predicted values with actual measured data covering a multitude of different types of propagation paths as well as environments. In addition, an analysis of the over-predictions and under-predictions would need to be undertaken to ensure that the delicate balance of these prediction errors is maintained in a way that does not advantage one industry over another. Certainly before the Commission would be able to reach any conclusion as to whether the proposed modifications should be adopted, all of the above studies and analyses would need to be completed and peer reviewed.

VI.   Higher Resolution Terrain Data and Additional Land Clutter Data Will Not Significantly Alter the Statistics of the Accuracy of the ILLR Model

18.   The use of higher resolution terrain data, as DIRECTV proposes, would not necessarily result in a different number of predicted unserved locations, as DIRECTV seems to

suppose. The use of different resolution terrain data could result in different predicted results

from any particular propagation model. However, the overall statistics of the number of served

versus unserved locations is not likely to be significantly different than it is using the current

USGS database.

19.   As with the terrain data, the use of different LULC data from the SRTM, as

DIRECTV proposes, could result in some individual differences as to served versus unserved

predictions, but the overall statistics are unlikely to change significantly. We also note that the

SRTM data tends to be somewhat "coarse" for urbanized areas with tall buildings and other

obstructions. Hence, the accuracy of any predictions using the SRTM data remains untested and

unproven. As the Commission has stated, the objective of any modifications to the existing

ILLR model would be to achieve a more accurate and reliable model, and DIRECTV fails to

demonstrate how the SRTM data would accomplish those goals.

VII.   DIRECTV's Proposed Propagation Parameters: F(90, 90)

20.   DIRECTV seems confused even by its own exhibit. In their comments to the

Commission, they propose changing from 50% location variability to 90% location variability in

the prediction model and reference their own exhibit. However, the attached exhibit does not

propose a change in the location variability but instead proposes to change the confidence factor

from 50% to 90%.

21.   If the *location* variability used with the Longley-Rice prediction methodology

were to be changed as indicated by DIRECTV, it would result in reducing the predicted field

strength in the neighborhood of 10 dB to 13 dB, depending on distance and antenna height.

However, the Longley-Rice algorithm, as implemented in the ILLR model for prediction of

television field strengths at a specific location, ignores the location variability factor since a

specific terrain path is being evaluated. Therefore, there is no reason to further consider the proposed *location variability* change.

22. On the other hand, a change in the *confidence* factor from 50% to 90% would also result in a reduction in the predicted field strength in a similar range (10 dB to 13 dB). However, the FCC has clearly indicated in its rulings and explanatory bulletins[4, 5, 6] that the *median* value is to be used for confidence rather than extreme values. DIRECTV has provided no real-world evidence, data, or justification for modifying the confidence factor from the median case. Hence, we see no reason to revisit the *confidence factor* parameter since the *median* case would certainly be most appropriate for inclusion in the model.

23. The adjustment of the confidence factor to 90% would unfairly bias the resulting predicted field strength in the prediction model and would result in huge number of households being re-classified as un-served when these locations are, in fact, served in the real-world environment. As stated above, the assumption of a 50% confidence factor (representing the median case) is the appropriate value for this parameter and should be retained by the Commission.

VIII. There Are Numerous Flaws with DIRECTV's Suggested New Planning Factors

24. In addition to propagation model modification suggestions, DIRECTV has also proposed changes to the planning factors used to determine reception at a typical viewer's home.

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[4] OET Bulletin 69, "Longley-Rice Methodology for Evaluating TV Coverage and Interference," February 6, 2004.

[5] OET Bulletin 72, "The ILLR Computer Program", July 2, 2002.

[6] OET Bulletin 73, "The ILLR Computer Program for Predicting Digital Television Signal Strengths at Individual Locations," November 23, 2010.

These planning factors include antenna gain, signal amplifiers, receiver noise floor, receiver noise figure, and receiver white noise threshold. DIRECTV is also proposing additional new planning factors for splitters and a "multipath margin." The Commission has always intended the planning factors to constitute a set of reasonable assumptions that must be made in order to mathematically predict not only signal field strength at the input to the viewer's rooftop antenna, but also the signal level that is presented to the input of the DTV receiver inside the home.

25. The Commission has always assumed that a viewer will make a reasonable effort to receive free, over-the-air television signals, and this includes properly using good consumer equipment in their homes. While the set of receive system planning factors used in the digital ILLR model for determining DTV service for a viewer establishes one baseline, it is clear that the Commission both recognizes and expects viewers to make a reasonable effort to alter their receive system so that it is appropriate to their specific situation in order to achieve DTV reception. It is also clear that one can select certain alternative receive antenna system designs that can achieve reception substantially improved over that assumed in the digital ILLR model or OET Bulletin 69. The assumption of specific receive system parameters plays a pivotal role in the prediction of DTV service. Thus, the selection of the appropriate planning factors for use in the prediction model is critical. We note that, to date, the existing planning factors have worked well and provided highly accurate determinations of which homes are served using the existing ILLR model.

26. As noted in the NAB/MSTV Reply Comments, the AntennaWeb.org service is purpose-built for conservatively predicting a class of receive antenna that will provide reception for certain television stations virtually without fail. It is not intended to be used as a model for determining field strength or DTV propagation path losses. Because the model serves a very

specific purpose, its use cannot be extrapolated into a propagation prediction model for the purpose of distant network eligibility. This would be similar to using a web-based tool that is designed to help the user pick clothing based upon predicted weather conditions and then extrapolating its results into a complete weather forecast.

27. Using the planning factors that DIRECTV proposes does not predict more accurately signal levels and DTV service. The proposed DIRECTV planning factors would simply bias the prediction results in favor of the satellite carriers. As the Commission has stated, and is the directive of Congress, providing accurate and reliable predictions of DTV service is the goal. Adopting these proposals would not accomplish this goal.

28. While the ultra-conservative parameters and methodology of the AntennaWeb model may be useful for safely recommending consumer antennas to viewers with virtually no chance of having them returned to the store for a failure to perform as expected, it is not an acceptable or accurate methodology for determining if a viewer can receive local DTV programming from a local broadcaster.

IX. The DISH Network/Kurby Analysis of 51% of "Users" Being Affected by Systemic Error Is Inaccurate

29. In the Engineering Statement of the DISH Network Comments, Mr. Kurby provides an analysis in which he concludes that "*Thus, the present ILLR model bias as presented by Shumate predicts that 51% of the unserved users are served contrasted with 19% in the ITWOM model as judged by the area covered.*" This analysis fails to properly characterize the situation as presented by Mr. Shumate. This simplistic analysis using a radius coverage area calculated by the maximum 600 Meter (approximately 2,000 Feet) antenna height falsely confuses the **area** of predicted coverage with the "**users**" or households.

30.   First, "users" that would be seeking distant network signals may or may not occupy these geographic areas, and therefore it would be inaccurate to characterize a coverage **area** as being entirely populated by potential "**users**" or households as they would not be evenly distributed throughout the geographic area. There is a distinct difference between a *geographic area* and *population*. So it is simply inaccurate to say that "51% of users" are unserved.

31.   Second, this simplistic analysis is based upon the absolutely largest low-VHF television facility possible with an antenna height at the absolute maximum height of almost 2,000 feet. Very few of the television stations in the U.S. have such large coverage areas or such tall antennas. Therefore, this analysis grossly overstates any potential impact on the geographic area under study and leads to an improper extrapolation of area to be actual households or users.

32.   Mr. Kurby's calculation of the coverage *area* is based upon the assumption of predicted signal strength using the empirical FCC(50,50) statistical field strength prediction curves in the FCC rules at a distance of 50 km (about 30 miles) from an omni-directional transmitter, a distance with no particular meaning or relevance. A better analysis would have employed the actual ILLR model currently used, or even the ITWOM proposed by Mr. Shumate, followed by an analysis of the actual number of *households* affected as based on the most recent census data. Since Mr. Kurby used the FCC(50,50) curves, his example describes an analog television service prediction rather than a digital service prediction. However, an analog comparison can be appropriate here for this simplistic theoretical discussion.

33.   Using a 50 km distance from the transmitter, Mr. Kurby determines that the alleged constant 6.61 dB bias caused by the ILLR model would cause the analog Grade B contour to shrink to 70% (i.e., 35 km) of that determined by the FCC curves. This hypothetical example of Mr. Kurby results in a coverage area reduction of 51% since it is proportionate to the

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distance squared for a circular coverage area.

34.   However, using his same simplistic approach, a comparison could be made at 90 km. At this distance, the field strength predicted by the F(50,50) curve would be about 40.4 dBu, which accounts for a 6.6 dB bias *below* the 47 dBu analog Grade B field strength for low-VHF. Then, if the Shumate unverified 6.6 dB over-prediction bias were assumed to be uniform throughout the service area, the distance from the transmitter where the 47 dBu Grade B value occurs would be at 75 km, which is only a 30% decrease in land area. It can be seen that the supposed decrease in service area is dependent upon the distance from the transmitter, assuming that the 6.6 dB Shumate bias were proven to be true and uniform everywhere.

35.   This analysis assumes that all households within the radius of coverage would receive signal levels that are within 6.61 dB of the white noise threshold of the system (i.e., a uniform bias); otherwise, there would be no question with regard to DTV service. This is very unlikely. In fact, the absolute accuracy of the model only comes into play in those locations where the signal level would be within that small 6.61 dB range of the predicted noise limited contour. That is to say, this only matters in those locations that are within the last few miles of the coverage area.

36.   Since the criteria for determination of served versus unserved households lead to a concise "go" or "no-go" determination with respect to the signal level being either above the noise-limited digital contour (41dBu for UHF) or below it, the amount above or below this level is not relevant to the ultimate determination of whether the household is served for the purposes contemplated here.

37.   Of course, the purported 6.61 dB of over-prediction allegedly caused by the ILLR model has been neither verified nor peer reviewed.

X.   DISH Network's VHF Clutter Factor Proposal Is Unsupported by Any Data

38.   The VHF clutter factor that is currently used by the ILLR model is set to zero. This was based upon the desire to make the model accurate in terms of balancing its over-predictions and under-predictions. This approach has worked well, and we are not aware of any problems or complaints that have been encountered by this implementation of the ILLR model.

39.   As the Commission is aware, the ILLR model is based, in part, upon empirical field test data. Thus, a clutter factor is already accounted for within the ILLR calculations, including for the VHF bands.

40.   In addition, as noted in a previous section, the comparison data supplied by Shumate does not make it clear if the LULC adjustment was included in the ITWOM predictions that were used for comparison to the ILLR model.

41.   Therefore, even using the unverified data supplied by Shumate, DISH cannot arrive at any supported conclusion with regard to the accuracy of the ITWOM model or the additional VHF clutter factor that they propose. There is apparently an assumption that the difference between the ITWOM prediction and the measured field strength (1.93 dB) must be related to the clutter factor. This conclusion is unsupported by any scientific data or measurements.

42.   The current treatment of the VHF clutter factor is appropriate. As stated several times in this proceeding, the balancing of the predictions is an important factor for consideration by the Commission. The adjustment of the VHF clutter factor to zero was undertaken by the Commission for a very good reason. It maintains the integrity of the balance of predictions in the ILLR model. This is an appropriate approach and we do not believe that any households have been adversely impacted by this policy.

XI.   Conclusion

43.   Mr. Shumate's proposals for the ITWOM model are premature and have not been fully reviewed, vetted, and analyzed, nor have they been peer-reviewed and accepted by the engineering and scientific communities. Nor do Mr. Shumate's proposals show that they would achieve the goals set forth by the Commission to achieve more accurate and reliable DTV field strength predictions. As we cannot verify the results of his comparisons to the ILLR model or duplicate his results, the Commission should reject the proposed modifications to the existing ILLR model.

44.   Furthermore, the Commission should reject the proposals put forth by DIRECTV to modify the existing planning factors and propagation model assumptions. Using the ultra-conservative, worst-case planning factors employed in the AntennaWeb model will significantly affect predicted DTV reception, unfairly biasing it negatively by substantially under-predicting DTV service.

45.   By adding an extra 26 dB (when a *non*-directional antenna is assumed) or 14 dB (when a directional antenna is correctly assumed) of signal degradation due to the assumption of improper receiving equipment, as well as an even additional 10 dB to 13 dB of signal degradation for increasing the confidence factor to 90% (instead of seeking median results), predicted signal levels will be artificially and significantly low—indeed, far lower than actual field strength under almost all conditions. This would unfairly bias, in a significant manner, the prediction of DTV service at locations where it actually is present. These proposals would lead to less accurate and reliable results than the current model already provides, instead of more accurate and reliable results.

46.   Finally, the Commission should reject the proposals put forth by DISH Network.

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These proposals would also unfairly bias the results of the prediction model in favor of the satellite carriers. As stated above, the adoption of additional VHF clutter factors has been previously considered and rejected by the Commission for sound reasons. DISH Network also proposes that the Commission should subtract an additional 1.93 dB "fudge factor" to account for alleged prediction errors. However, as stated above, these "errors" in prediction versus measured field strength have not been corroborated or verified, and, based upon the information available, cannot even be duplicated. Subtracting an additional "fudge factor" from the prediction results would upset the balance of over- and under-prediction errors and jeopardize the integrity of the model.

47.   It is clear that any modifications to the ILLR model should be tested, verified, and peer-reviewed, none of which, to date, has been undertaken in a transparent or repeatable manner. For these reasons, the Commission should reject the various proposals to modify the ILLR model.

Respectfully submitted:

   /s/

William Meintel

   /s/

Gary Sgrignoli

   /s/

Dennis Wallace

February 7, 2011